Conference Paper

One Tutor for Two Groups: Student-centered Learning Stimulation in Problem-based Discussion with Two Way Close Circuit Tele-Vision (CCTV)

N Dian[1,3], J Subandono[2], Sarsono[2], and Martini[2]

[1]Medical Education Unit, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia
[2]Biochemistry Laboratorium, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia
[3]Competency Based Curriculum Tutorial Laboratorium, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia

Abstract

The study aimed to analyse activities on social cognitive adaptation according to Post Vygotskian learning theories. This qualitative study employed Phenomenology data from the Indonesian undergraduate medical student to showcase the tutorial activities with two ways CCTV that involved constructing knowledge and building mutual agreements with peers collaboration in a safe environment. Data were collected from the reports, recorded and in-depth interviews among six group members of the students. Each group consisted of 10-15 students. A total of sixty-nine students were participated in the present research. At the end of the analysis process, we held a panel discussion between the researcher and three coders. The study found that the participants: (1) talk a loud and felt safe with activities, (2) share information equally "peer to peer" to get essential knowledge, (3) have more freedom "bargain and share" activities. Overall, the students were satisfied with their learning activities but they needed tutors to give verification "just in time." The study concluded three activities based on theories of problem based discussion. The findings implied how one tutor can facilitate discussion of two groups.

Keywords: advancement of medical science/education; medical education technologies; student centered-learning; problem based-discussion

1. Introduction: Social Cognitive Adaptation on Two Ways Close Circuit Tele-Vision (CCTV) Stimulates Student Centered-Learning

The problem-based discussion is the main activities in Problem Based Learning Curricula. This activity needs student participation. The social cognitive concept adapts to problem-based discussion application with two ways of CCTV technology to create a

OPEN ACCESS

safe environment for stimulating Student Centred-Learning (SCL). This CCTV technology has been reported to increase participation in problem-based discussion among medical students [1]. The shifting paradigm in Indonesia medical education needs social cognitive adaptation with technology.

Indonesian medical students are used to Teacher Centred-learning (TCL) so that they have less epistemological belief on SCL. In TCL, the teacher is still nurturing knowledge and skill competencies. It has been argued that SCL stimulation needs a suitable environment in order to increase epistemological beliefs among that students [2]. An individual's sociocultural aspect accounts for the development of the higher mental function in learning. Learning itself is leading or fostering cognitive development [3]. Post-Vygotskian social cognitive adaptation is achieved by practicing interpersonal abilities among tutor and student. This ability includes creating flow interaction within groups, coping with the unpredictable nature of member interactions, and giving a challenging role in group work [4]. The application of CCTV on problem based-discussion can provide the proof of these abilities.

The application of CCTV is necessary for giving the best evidence of a learning process. The suitable CCTV system is one that enabled two way communication activities in a real time. Another CCTV has the ability to identify specific occasion and able to control the process remotely [5]. This function makes CCTV can create a safe environment. It also influences sharing activities and avoid the passive group [6]. Thus, CCTV can reduce tutor participation during problem discussion if this present study can reveal those CCTV function.

This study searched for constructive knowledge, mutual agreements built within the group, and freedom formed-activity of an individual in the group. The main question is: Can Problem based-discussion with two-way communication CCTV stimulate SCL? Is there any pattern in activities aligned to dynamics adaptation of social cognitive theories?

2. Research Procedures

The Perception were data accumulated from a qualitative study of Phenomenology by Indonesia students. The data were formed from the broad spectrum of problem based-discussion reports. This recorded problem based-discussion activities and in-depth interviews among students. The data were obtained from 6 problem based-discussion groups, each group consisted of 10-15 students allocated by the 1st researcher. Other researchers checked the presence of a bias, whether there is a gap between the

proportion of underperformed and high performed students. The study was adjusted to the average student population. Every two groups had one tutor behind the monitor. The tutor would respond with hints from another room for two groups. Two ways audio CCTV was provided to facilitate communication between tutor and student groups. Three coders alternately analyzed the data using phenomenology approaches. The panel discussion between the researcher and coders was conducted to conclude the data saturation. A discussion room was prepared along with the research protocol in the module that mentioned the CCTV specification, the setting of the room, questionnaire and briefing procedure.

2.1. The CCTV specification

The study used a "xiaomiyi home" CCTV with these minimum specifications:

- 720p 20fps (1280x720) image quality
- Two-way voice intercom function,
- Clear (crystal) sound performance,
- Zoom function,
- Wifi protocol with IEEE 802.11 b/g/n,
- Supported protocols with IPV4, UDP, TCP, HTTP, DHCP, P2P.
- A supported operating system with Android 4.0 above / IO7 above.
- Yi Home android/IOS application

The camera was positioned at the front and at the student blank spot (at the left or right side whiteboard). This position of gave a broad coverage of camera angle and an audio receiver. Electricity and wifi signal was checked. There were also reserve power banks and a server.

2.2. The room setting

The minimum room space was twenty-meter squares equipped with a letter U table and chair set formation with a whiteboard at the front. The room had good resonance adaptability with the noise level below 40-decibel.

2.3. Questionnaire

Two central research questions were the main topic of this present study. We asked the details of the discussion process, the roles of CCTV technology and knowledge acquisition experienced by students. The issue was queuing what the respondent felt the best and worst experiences. The item asked was what could be better developed in the CCTV tutorial. We conducted problem discussion among 3 of non-respondent groups to test the instrument. This is for checking bias, validity, reliability, and eligibility. Five non-respondent group members were invited and asked about the meaning of the item being asked.

2.4. Briefing procedure

The first briefing was to communicate the problem scenario and Maastricht's seven steps of problem-based discussion. It also explained the discussion and the interaction process. This briefing was held at the beginning of the research. The second briefing was to check the CCTV, its signal, and electricity. It was held before the discussion session began.

3. Findings and discussion

Some facts come out as our findings: (1) Talk Loud activities, (2) Information shares equally, (3) "Bargain and share" activities. Those facts are linear with learning theories of constructivism, social cognitive and active learning. Our findings also draw how two way CCTV elicits flexibility within the group. It includes unpredictable "peer to peer" collaboration and more active participation of students in a task challenge. It shows linearity between the dynamic of problem-based discussion activities and theories.

"Talk a Loud" activities involved fluent participation from both tutor and students. Unclearness make slow and awkward discussion. Students need to focus and hear carefully.

> "...sometimes felt one direction... when we did not get focus or mishearing, we shout WHAAAT..(expressing uncleared instruction from CCTV).."

The student talks loud. This act makes other stays wake up.

> "...we need a talk or give sign clear to get attention..so everybody seems to stay on the alert."

These findings also work with a tutor. Tutor in other rooms should give short and clear hints. The exact stimulation makes fluid discussion dynamics — the students were nurtured with proper instruction since they have less epidemiological belief [2]. Loudness stimulates two-way direction communication although this loudness increased room noise. CCTV dynamics were better than problem based discussion with a tutor. The CCTV creating a less unmeaningfull buzz group [7]. So, the study recommends CCTV as an alternative to the tutor less problem-based discussion.

Knowledge and information were shared equally among students. They made their own knowledge being synchronized to suit each other needs. They felt happy to experience a surprising moment. The students were accidentally aware of what they did not know yet.

> *"..Tutor gave hints instantly...got a reaction...every student alternately giving reaction what the group missed.."*

The discussion dynamics were not interrupted. The discussion reached the "flow" phenomenon. The student constructed knowledge jigsaw "peer to peer." The student with self-determination had forethought and amazingly sought their knowledge. The student could not achieve it when the flow phenomenon was not happening [5]. The tutor stimulated that SCL was demanding when eliciting the flow phenomenon. The student was forming unexpected own "peer to peer" to get essential knowledge.

> *"...There was a tutor who often cut..instantly cut in the middle of a discussion...so the discussion...we felt awkward..without tutor seem (information sharing dynamics)... better."*

The tutor, yet, detected the possibility of "out-of-topic discussion" but a flow phenomenon would give a miracle to fix it. The problem based-discussion with CCTV could maintain the "flow" phenomenon. This phenomenon happened when the students felt flawless interaction among them. Those explained why the students could be active. They had adequate opportunities for participating in a discussion without being interrupted [6] — this type of problem based-discussion matched with the concept of the social cognitive process.

The primary sources of SCL are about bargain and shares. Knowledge building begins with equal standing among participants. The active discussion needs safety learning environments [1, 3, 4]. In-absentia of tutor creates an unprovocative situation. The student feels freedom and safe so they can construct knowledge.

> *"...We felt safe to gave information... more freedom..."*

However, the students still need a tutor role for verification "just in time" despite they feel more comfortable discussing without a tutor.

"…we sometimes met a tutor who confirmed in the right time… and it is (expressing like)…"

This problem based-discussion with CCTV has roles for creating a safe environment.

4. Conclusion

Social cognitive theory through problem-based discussion can be facilitated by one tutor with two ways CCTV on two groups. Despite physically absent, a tutor can stimulate SCL in Indonesia cultured undergraduate medical students although the students still need tutors to make confirmation. Three activities were shown to be the main findings on how two ways CCTV communication can stimulate SCL in the problem-based discussion. They "talk-aloud," share information equally "peer to peer" and have more freedom "bargain and share" activities. There will be further development towards measuring magnitude and learning outcome achieved through problem-based discussion with this technology.

References

[1] Bandura A 2002 *Social Cognitive Theory in Cultural Context* Applied Psychology (Wiley) 51(2):269–90. Available from: http://dx.doi.org/10.1111/1464-0597.00092

[2] Veronika I 2017 *Epistemiological belief factors in problem based collaboration learning* (Dissertation electronic material on [internet]). Available from: http://etd.repository.ugm.ac.id/index.php?mod=penelitian_detail&sub=PenelitianDetail&act=view&typ=html&buku_id=116912&obyek_id=4)

[3] De Valenzuela J S 2006 *Sociocultural Views of Learning* The SAGE Handbook of Special Education [Internet] (SAGE Publications Ltd) pp 281–90. Available from: http://dx.doi.org/10.4135/9781848607989.n22

[4] Kegan R 2002 What "form" transforms? Contemporary Theories of Learning (Routledge) pp 29–45. Available from: http://dx.doi.org/10.4324/9781315147277-3

[5] Teague C and Green L 2012 *Using CCTV footage as a communication training and safety Resource.Proc. of ANZCA Conf.* (Adelaide) p 12 [Internet]. Available from: http://ro.ecu.edu.au/ecuworks2012/110.

[6] Barker D, Quennerstedt M, Annerstedt C 2013 *Inter-student interactions and student learning in health and physical education: a post-Vygotskian analysis* Physical Education and Sports Pedagogy (Informa UK Limited) 20(4):409–26. Available from: http://dx.doi.org/10.1080/17408989.2013.868875